

SOAH DOCKET NO. 582-07-2673
TCEQ DOCKET NO. 2007-0204-WDW

APPLICATION OF TEXCOM GULF	§	BEFORE THE STATE OFFICE
DISPOSAL, L.L.C. FOR TEXAS	§	
COMMISSION ON ENVIRONMENTAL	§	OF
QUALITY UNDERGROUND INJECTION	§	
CONTROL PERMIT NOS. WDW 410,	§	
WDW411, WDW412 AND WDW 413	§	ADMINISTRATIVE HEARINGS

SOAH DOCKET NO. 582-07-2674
TCEQ DOCKET NO. 2007-0362-IHW

APPLICATION OF TEXCOM GULF	§	BEFORE THE STATE OFFICE
DISPOSAL, L.L.C. FOR TEXAS	§	
COMMISSION ON ENVIRONMENTAL	§	OF
QUALITY INDUSTRIAL SOLID	§	
WASTE PERMIT NO. 87758	§	ADMINISTRATIVE HEARINGS

PRE-FILED TESTIMONY OF

RICHARD C. BOST, P.E. (TX), P.G. (TX), CCGWP (INT'L)

ON BEHALF OF APPLICANT TEXCOM GULF DISPOSAL, LLC

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APPLICATION OF TEXCOM GULF DISPOSAL, L.L.C. FOR TEXAS COMMISSION ON ENVIRONMENTAL QUALITY UNDERGROUND INJECTION CONTROL PERMIT NOS. WDW 410, WDW411, WDW412 AND WDW 413	§ § § § § §	BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS
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APPLICATION OF TEXCOM GULF DISPOSAL, L.L.C. FOR TEXAS COMMISSION ON ENVIRONMENTAL QUALITY INDUSTRIAL SOLID WASTE PERMIT NO. 87758	§ § § § §	BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS
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PRE-FILED TESTIMONY OF
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ON BEHALF OF APPLICANT TEXCOM GULF DISPOSAL, LLC

1 **I. BACKGROUND**

2 Q: PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

3 A: My name is Richard C. Bost and I work at 15810 Park Ten Place, Suite 300, Houston,
4 Texas.

5 Q: WHAT IS YOUR OCCUPATION?

6 A: I am a Senior Partner at Environmental Resources Management (ERM), an
7 environmental consulting firm.

8 Q: PLEASE DESCRIBE YOUR FORMAL EDUCATION.

1 A: I hold a M.E. in Environmental Engineering, Rice University (1978) and a B.A.
2 Environmental Sciences and Engineering, Rice University (1976). I also completed
3 graduate course work in Public Health Studies and Urban Health at the University of
4 Texas (1977-1978). I have completed a number of EPA and State Air Permitting and
5 compliance courses and conducted graduate research regarding physical properties and
6 handling of industrial wastes, ambient monitoring and transportation air emission
7 control alternatives. I also completed EPA health and safety courses and the National
8 Spill Control School at the University of Corpus Christi. I have also had medical
9 training from the U.S. Army.

10 Q: WHAT PART OF YOUR EDUCATIONAL BACKGROUND FOCUSED ON
11 WATER RESOURCES AND INDUSTRIAL WASTE HANDLING AND DISPOSAL
12 OR RELATED TOPICS?

13 A: I completed coursework that covered various aspects of hydrology, hydrogeology,
14 geology, environmental chemistry, chemical engineering including catalysts, material
15 science including corrosion, remediation technologies, ground water modeling, water
16 supply, and fate and transport of environmental pollutants in the environment. My
17 graduate research studies focused on watershed management, the recharge of ground
18 water and surface water of the Woodlands, including sampling runoff in a suburban
19 mixed use context in Montgomery and Harris Counties, as well as toxicology and
20 epidemiology of pollutants in the Lake Houston watershed.

21 Q: WHAT PROFESSIONAL LICENSES DO YOU HOLD?

1 A: I am a Texas Professional Engineer, a Texas-licensed Professional Geoscientist, and an
2 internationally-licensed Certified Ground Water Professional.

3 Q: PLEASE DESCRIBE YOUR RELEVANT PROFESSIONAL EXPERIENCE.

4 A: I have over 30 years of experience managing a broad range of environmental projects.
5 I have worked for ERM for about 25 years, starting in 1984. With ERM I have been
6 involved in providing regulatory compliance assistance and environmental engineering
7 and hydrogeologic evaluations for commercial, residential and industrial properties,
8 including commercial waste management sites. I have completed siting, engineering,
9 permitting, and design studies for various types of waste disposal facilities, including
10 injection wells, landfills, land treatment units, and incinerators. I have provided expert
11 testimony regarding compliance issues related to commercial disposal facilities. I have
12 also completed waste minimization evaluations and waste disposal projections for
13 commercial waste disposal and treatment facilities in Texas; provided compliance
14 assistance and audits of chemical plants, smelters, plating operations, manufacturing
15 facilities, utilities, refineries and oil and gas operations in the U.S., Mexico, South
16 America and Europe; and helped develop root cause analysis protocol for improving
17 compliance. I have testified in federal and state court cases regarding compliance,
18 siting, site investigation and remediation issues. I have been the principal investigator
19 for waste and wastewater treatment evaluations, development of water supplies, waste
20 site monitoring plans, remedial investigations, ground water remediation and release
21 and spill site closure plans; these have included detailed design, construction drawings,
22 construction sequence, safety and post closure plans. I have also managed construction
23 of landfills, wastewater treatment systems and site remediation systems. I have served

1 as principal investigator and as manager and project director for numerous Safe
2 Drinking Water Act, Resource Conservation and Recovery Act (RCRA), Clean Water
3 Act, and Clean Air Act permitting projects.

4 Q: PLEASE DESCRIBE YOUR RELEVANT PROFESSIONAL EXPERIENCE PRIOR
5 TO JOINING ERM.

6 A: Prior to ERM I worked for the Texas Air Control Board, Dames and Moore,
7 D'Appolonia Consulting Engineers, JDE, and IT Corporation between 1977 and 1984.
8 I conducted various enforcement monitoring activities, assisted with and then managed
9 various siting and permitting projects, helped develop water supplies and oversaw
10 water well drilling, managed cleanups, and provided field oversight for Superfund
11 projects. My initial functional position with JDE was senior liaison to the program
12 management office of the Department of Energy's office in New Orleans for the
13 Strategic Petroleum Reserve. I was then a Senior Project Specialist providing
14 regulatory assistance to different clients as well as dealing with construction
15 management and remedial design for Superfund Sites and for remedial requirements of
16 industrial facilities, including design for Superfund environmental waste management
17 facilities.

18 Q: WHAT PERCENTAGE OF YOUR WORK HAS DEALT WITH WASTE
19 MANAGEMENT AND DISPOSAL?

20 A: About 80% of my work since the introduction of RCRA regulations in 1980 has dealt
21 with waste management and disposal issues for well over 1,000 facilities.

1 Q: WHAT EXPERIENCE DO YOU HAVE SPECIFICALLY WITH UNDERGROUND
2 INJECTION CONTROL OR "UIC" FACILITIES?

3 A: I have worked on a number of projects dealing with UIC facilities. For example, I
4 have been involved in the investigation of and remedial evaluations for UIC injection
5 well facilities in Texas and Louisiana; no migration assessments for UIC injection well
6 facilities in Texas; siting studies, permitting, and engineering assessments for wells in
7 East Texas; the re-evaluation of maximum operating pressures for UIC injection wells
8 in Texas; due diligence assessments for UIC injection well facilities in Texas; review
9 of historic injection well operations in Louisiana and near Houston, Texas; compliance
10 reviews of injection well operations in Texas; an investigation of the effects of a fire
11 on an UIC injection well in Louisiana; a historical compliance review of injection well
12 operation in conjunction with petroleum refinery operations; a comprehensive review
13 of UIC injection well waste injection activities in the Texas Coastal Bend area over a
14 period of 6 years; the evaluation of the use of the UIC permit program for carbon
15 sequestration well permitting; a historical review of carbon dioxide injection for an
16 enhanced oil recovery operation; and review and comment on proposed injection well
17 regulations in Texas.

18 Q: WHAT RELEVANT EXPERIENCE DO YOU HAVE WITH OTHER TYPES OF
19 WASTE DISPOSAL FACILITIES?

20 A: I have significant experience with other types of waste disposal facilities as well,
21 including permitting, evaluating alternatives, and assessing public interest issues. For
22 example, I just recently finished up work on a project related to the Turtle Bayou

1 Superfund Site, an abandoned waste disposal site from the 1970s. For that project we
2 were involved in assessing alternatives for the remediation and final closure of a
3 couple of waste disposal areas at the site. Because this area also had residences within
4 a few hundred feet of the disposal areas, there was a strong public interest aspect to
5 this project, with a large amount of direct interaction with the public to keep them
6 informed of our activities and to address their concerns regarding acceptance of the
7 EPA-approved remediation and closure plan.

8 I also worked on several projects that involved the review of permit conditions for
9 municipal and industrial waste disposal facilities, including injection wells, in Texas
10 and Louisiana. In general, these projects entailed assessments of facility engineering
11 and operations. In a project located in the Austin area, I focused on the reliability of
12 synthetic liners and leachate collections systems versus natural clay liners, landfill
13 construction techniques and construction monitoring programs, and landfill
14 performance evaluation procedures. In another project, I focused on the nature of
15 wastes disposed in a landfill near Corpus Christi and on the potential for migration.

16 Other relevant waste disposal project experience includes the following:

- 17 • Siting studies, permitting and engineering for commercial landfills, transfer
18 stations, waste treatment units and land treatment units in Texas and
19 Louisiana;
- 20 • Risk and natural resource damage assessment for former landfill operations in
21 West Texas;
- 22 • Technical advisor for dispute between parties associated with permitting
23 commercial landfill facilities in Arkansas;
- 24 • Investigation of brine injection well activities and causes of saline water
25 intrusion in aquifers in Texas, Louisiana and Oklahoma;

- 1 • Investigation of effects of hydrocarbon salt dome storage well operation and
2 saline water intrusion near Freeport, Texas;
- 3 • Alternative evaluation of waste management and disposal options for an East
4 Texas Industrial Complex;
- 5 • Alternative evaluation of waste management and disposal options for an oil
6 and gas equipment manufacturing operation in Harris County;
- 7 • Evaluation of alternatives to deep well injection for an international
8 manufacturing corporation;
- 9 • Review of potential liabilities regarding a Texas Federal Superfund site where
10 a deep injection well was not part of the Superfund Site;
- 11 • Investigation of historic oil and gas waste disposal operations at multiple sites
12 in Texas and Louisiana;
- 13 • Engineering and permitting for industrial and municipal landfills at multiple
14 states;
- 15 • Design and construction of seepage controls utilizing agricultural drainage
16 systems for refinery land treatment units and landfills at three southern
17 refineries;
- 18 • Investigation of seepage associated with industrial, flood control and water
19 supply berms and embankments for landfills, industrial impoundments and
20 locations along the Mississippi River;
- 21 • Cause analyses for liner failures and disposal and containment alternatives for
22 a Federal Superfund Site in Jacksonville, Arkansas;
- 23 • Design for a new 80-acre industrial landfill near Houston, Texas;
- 24 • Cause analyses and remedial measures required to control landfill seepage
25 from two solid waste landfills in East Texas;
- 26 • Design and installation of slurry wall containment systems for landfills,
27 impoundment, and spill sites for refineries, chemical plants, and train
28 derailment spill sites;
- 29 • Engineering and development of solid waste management systems and
30 performed compliance audits for refineries, steel mills, mines and
31 petrochemical plants in the United States, Europe, and South America;

- 1 • Expert evaluations regarding landfill closure for an industrial landfill in
2 central Oklahoma, a solid waste management area on the Trinity River in
3 central Texas, and a municipal landfill in south Texas;
- 4 • Engineering and wastewater treatment permitting for industrial plants in
5 Texas, Louisiana and Oklahoma; and
- 6 • Alternative offsite disposal evaluations as part of the remediation and
7 negotiated cleanup of industrial landfills and Superfund sites in Texas,
8 Oklahoma, Missouri, Arkansas, Louisiana, Mississippi, South Carolina, Iowa,
9 Indiana and California.

10 Q: WHAT PREVIOUS EXPERIENCE DO YOU HAVE WITH EVALUATING
11 ALTERNATIVES TO A PROPOSED WASTE DISPOSAL FACILITY,
12 SPECIFICALLY IN THE PERMITTING CONTEXT?

13 A: I have evaluated alternatives to a proposed waste disposal facility for each of the
14 following projects. As part of these evaluations I considered minimization of waste
15 generation, alternative methods of disposal including alternative waste treatment
16 methods, as well as alternative locations. I also evaluated public interest issues related
17 to the proposed projects.

- 18 • Permitting for an industrial landfill in Chambers County, Texas for a Houston
19 industrial client;
- 20 • Permitting for a commercial landfill south of Houston, Texas;
- 21 • Permitting for a commercial landfill near Baton Rouge, Texas;
- 22 • Permitting for an onsite waste disposal facility near Dallas, Texas;
- 23 • Permitting for a commercial landfill near Lone Star, Texas;
- 24 • Permitting for an injection well for a refinery near New Orleans, Louisiana;
- 25 • Permitting for an injection well near Dallas, Texas;
- 26 • Permitting for an injection well in Deer Park, Texas;

- 1 • Permitting for injections wells associated with salt dome storage cavern
2 leaching operations, near Freeport, Texas; and locations in Louisiana; and
- 3 • Permitting option review for salt water disposal for East Texas Salt Water
4 Disposal in support of oil production operations in the East Texas Oil Field.

5 Q: DO YOU HAVE ANY EXPERIENCE IN EVALUATING PUBLIC INTEREST
6 ISSUES?

7 A: Yes, I have studied public interest issues during my undergraduate and graduate
8 coursework, and I have evaluated public interest issues professionally during my career
9 as well. I have also conducted public interest surveys.

10 Q: DO YOU HAVE ANY EXPERIENCE IN EVALUATING PUBLIC INTEREST
11 CONSIDERATIONS RELATED TO WASTE DISPOSAL?

12 A: Yes, I have evaluated public interest issues and participated in advisory groups as part
13 of waste management planning for the San Jacinto River Basin, the Houston Galveston
14 Area Council, and for TCEQ's predecessor agency, the Texas Natural Resources
15 Conservation Commission (TNRCC). As part of the latter service, I advised the
16 TNRCC on industrial air quality, water quality, and waste management issues,
17 including the development of regulations implementing the UIC program and drafts of
18 the guidance document titled *Construction Guidance for Class I Injection Wells*.

19 Q: IN PARTICIPATING IN THOSE PUBLIC INTEREST AND ADVISORY GROUPS,
20 WHAT SPECIFIC TOPICS DID YOU ADDRESS?

1 A: Reliability, practicality, long term and short term risk, economics, risk of spills and
2 accidents, exposure issues, classification of wastes, and protection of ground water
3 quality.

4 Q: WHAT BACKGROUND OR EXPERIENCE DO YOU HAVE TO COMMENT ON
5 PUBLIC INTEREST ISSUES RELATED TO UNDERGROUND INJECTION AND
6 PROTECTION OF GROUND WATER?

7 A: My education, geoscience background, ground water experience, injection experience,
8 modeling experience, experience with brownfield redevelopment projects, and
9 industrial development experience.

10 Q: COULD YOU PLEASE DESCRIBE BRIEFLY WHERE YOUR OPINIONS
11 REGARDING WASTE DISPOSAL AND RELATED ISSUES HAVE BEEN
12 ADOPTED BY STATE OR FEDERAL AGENCIES OR BY STATE OR FEDERAL
13 COURTS?

14 A: My opinions regarding waste disposal issues have been adopted numerous times by
15 State and Federal agencies and courts, including decisions relating to the Vertac,
16 Hardage, Sikes, French Limited, Koppers, and Gould Superfund Sites and landfills and
17 spill sites in Texas, Louisiana, and Oklahoma. Additional details regarding these are
18 found in my Curriculum Vitae (CV).

19 Q: HAS ANY OF YOUR PROFESSIONAL WORK BEEN PUBLISHED IN
20 JOURNALS OR PUBLICATIONS READ BY PROFESSIONALS IN YOUR FIELD?

1 A: I have been an author or co-author for over 30 papers dealing with a broad range of
2 topics including site investigation and remediation, hydrogeology, underground
3 injection, fate and transport modeling, air modeling, bioremediation, environmental
4 forensics, and statistics. An updated list of my publications is provided as part of my
5 CV.

6 Q: I AM SHOWING YOU WHAT HAS BEEN MARKED AS TEXCOM EX. 93.
7 COULD YOU PLEASE IDENTIFY THIS DOCUMENT?

8 A: Yes, it is a true and correct copy of my updated CV.

9 **APPLICANT OFFERS TEXCOM EX. 93**

10 Q: RELATIVE TO THE PROJECTS YOU HAVE BEEN TALKING ABOUT, WERE
11 YOU THE PRINCIPAL INVESTIGATOR, DIRECTOR, OR A MAJOR
12 CONTRIBUTOR ON THE PROJECTS?

13 A: Yes, I was the principal investigator, director, or a major contributor on each of the
14 projects I have mentioned.

15 **APPLICANT OFFERS MR. BOST AS AN EXPERT IN WASTE DISPOSAL.**

16 **II. OVERVIEW OF ALTERNATIVES FOR LIQUID WASTE DISPOSAL**

17 Q: GENERALLY SPEAKING, WHAT ARE THE POSSIBLE TREATMENT AND
18 DISPOSAL PRACTICES FOR HANDLING LARGE QUANTITIES OF LIQUID
19 INDUSTRIAL WASTE?

20 A: Depending on the characteristics of liquid waste, the following practices may be used:

- Treatment at wastewater, water and other treatment facilities (including Publicly-Owned-Treatment Works) followed by disposal to surface water bodies;
- Pretreatment of water followed by disposal to coastal waste disposal facility (CWDF);
- Solidification of the liquid waste and subsequent landfilling;
- Incineration at a permitted facility; and
- Underground injection control (deep well injection).

Q: GENERALLY SPEAKING, HOW DO THE VARIOUS WASTEWATER DISPOSAL ALTERNATIVES COMPARE TO UIC, OR DEEP WELL INJECTION?

A: UIC represents a permanent containment and disposal of liquid wastes that is safer, more reliable, more economical, and has fewer environmental impacts than any of the other disposal options. Landfills have a very large land requirement, and present the potential for the leaching of hazardous constituents into the subsurface and/or ground water. Wastewater treatment plants are highly dependent on operation and maintenance of all operations, require the use of chemicals and membranes that must be manufactured and transported to the treatment plant, have a large land requirement, and ultimately discharge the treated wastewater stream, which will include residual constituents, to surface water or oceans. Incineration facilities emit significant amounts of air pollutants, and generate ash that must be disposed of somehow.

UIC disposal, on the other hand, presents none of these challenges. When liquid waste is captured deep beneath the ground surface in a contained formation tapped by a deep injection well, it is trapped there and is absorbed or degrades naturally in a safe, contained location and can no longer influence our air quality and surface water quality

1 and the aquifers we use for drinking water. In addition, UIC Class I injection will be
2 similar in cost or less costly compared to alternative disposal methods for Class I non-
3 hazardous waste generated in Montgomery County.

4 **III. GENERATION AND DISPOSAL OF INDUSTRIAL LIQUID WASTE IN**
5 **MONTGOMERY COUNTY**
6

7 Q: ARE YOU FAMILIAR WITH THE CURRENT STATE OF LIQUID WASTE
8 DISPOSAL IN MONTGOMERY COUNTY?

9 A: Yes, I have studied records kept by TCEQ concerning the generation and disposal of
10 wastes in Montgomery County and surrounding counties.

11 Q: IS MONTGOMERY COUNTY A RELATIVELY SIGNIFICANT GENERATOR OF
12 LIQUID WASTES?

13 A: Yes, in comparison to other counties in the area, only Harris County generates more
14 liquid waste.

15 Q: WHAT TYPES OF FACILITIES IN MONTGOMERY COUNTY GENERATE
16 CLASS 1 NON-HAZARDOUS LIQUID WASTE?

17 A: Oil and gas service companies, oil and gas production operations and storage terminals
18 and pipelines, petrochemical industries, dry cleaners, light industrial manufacturing
19 operations, municipal plants, municipalities, warehouse storage operations, printing
20 operations, agricultural spraying operations, agricultural chemical businesses, and
21 numerous businesses that use small amounts of chemicals for cleaning, pest control,
22 and other purposes.

1 Q: HOW MUCH CLASS 1 NON-HAZARDOUS LIQUID WASTE IS GENERATED
2 ANNUALLY IN MONTGOMERY COUNTY?

3 A: In 2007, approximately 4.7 billion pounds of Class 1 non-hazardous liquid waste were
4 generated in Montgomery County, based on corrected TCEQ records and excluding
5 surface water discharges through publicly owned treatment works (POTWs).
6 Assuming average density of 8.34 lbs/gal (density of water), this waste is estimated to
7 have an annual volume of approximately 570 million gallons. On average,
8 approximately 1.6 million gallons per day of Class 1 non-hazardous liquid wastes are
9 generated daily in Montgomery County.

10 Q: WHAT IS THE DISPOSAL CAPACITY OF TEXCOM'S PROPOSED FACILITY?

11 A: The maximum volume proposed for the initial well is 350 gallons/minute or about
12 500,000 gallons per 24-hour day, approximately 1/3 of the wastes generated daily on
13 average in Montgomery County.

14 Q: ARE THE TYPES OF LIQUID WASTES PROPOSED TO BE ACCEPTED AT
15 TEXCOM'S FACILITY GENERALLY CAPABLE OF BEING RECYCLED?

16 A: No, these wastes are generally not capable of being recycled because they are not
17 concentrated and do not contain substances of value in recoverable concentrations.
18 Furthermore, these wastes may be difficult to pretreat or recycle because they may
19 exhibit characteristics that limit their treatability. Dilute acids or dilute caustics are
20 examples of such wastes.

1 Q: IS THE LIQUID INDUSTRIAL WASTE BEING GENERATED IN
2 MONTGOMERY COUNTY CURRENTLY BEING DISPOSED OF WITHIN
3 MONTGOMERY COUNTY?

4 A: No. According to TCEQ's certified records, in 2007, about 75% of the liquid
5 industrial waste generated in Montgomery County was disposed of in Jefferson
6 County, about 24% was disposed of in Liberty County, about 1% was disposed of in
7 Nueces County, and less than 1% was disposed of in Harris County.

8 Q: IN SUMMARY, HOW MUCH OF THE SUBJECT LIQUID WASTE GENERATED
9 IN MONTGOMERY COUNTY IS CURRENTLY DISPOSED OF OUTSIDE OF
10 MONTGOMERY COUNTY?

11 A: For the waste generated in Montgomery County in 2007, approximately 99.9% (by
12 weight) was disposed of in counties other than Montgomery County.

13 Q: WHAT ARE THE WASTE DISPOSAL FACILITIES THAT ARE USED BY
14 GENERATORS OF CLASS 1 NON-HAZARDOUS LIQUID WASTE IN
15 MONTGOMERY COUNTY?

16 A: There are several Class I non-hazardous liquid waste disposal facilities that have been
17 used by generators in Montgomery County:

- 18 • Newpark Environmental Services, and Veolia ES Technical Solutions in
19 Jefferson County;
- 20 • Environmental Processing Systems in Liberty County;
- 21 • Republic Waste in Chambers County;

- 1 • Bealine Service Co., BFI, CES Environmental Services, Clean Harbors,
2 Intergulf Corporation, Liquid Environmental Solutions, Nuclear Sources and
3 Services, Philip Reclamation, SET Environmental, and US Oil Recovery in
4 Harris County;
- 5 • DuraTherm and Waste Management in Galveston County and Republic Waste
6 in Brazoria County; and
- 7 • US Ecology in Nueces County.

8 Q: WHAT FACILITIES CURRENTLY EXIST IN MONTGOMERY COUNTY FOR
9 THE COMMERCIAL DISPOSAL OF CLASS 1 NON-HAZARDOUS LIQUID
10 WASTE?

11 A: Western Waste of Texas, LLC, and municipal utility district wastewater treatment
12 facilities.

13 Q: WHY AREN'T THE DISPOSAL FACILITIES THAT CURRENTLY EXIST IN
14 MONTGOMERY COUNTY BEING USED BY THE GENERATORS IN
15 MONTGOMERY COUNTY?

16 A: Western Waste of Texas is a landfill where solidification of liquid waste is not
17 economical and the municipal utility district treatment facilities are not designed to
18 treat the type of liquid wastes being disposed of outside Montgomery County.

19 Q: ARE THERE SUFFICIENT DISPOSAL FACILITIES IN MONTGOMERY
20 COUNTY?

21 A: No. In my review of other disposal facilities, I did not find sufficient disposal capacity
22 in Montgomery County. Only one commercial facility was identified and it is a
23 landfill. The only other options in Montgomery County are municipal utility district

1 treatment plants that are not suited to accept the types of wastes that are currently
2 being generated in and disposed of outside Montgomery County.

3 **IV. DISCUSSION OF ECONOMIC IMPACT OF PROPOSED UIC WELL**

4 Q: HAVE YOU CONDUCTED A COMPARATIVE ANALYSIS OF COSTS FOR
5 DISPOSAL BETWEEN THE PROPOSED FACILITY AND EXISTING
6 ALTERNATIVE OPTIONS?

7 A: Yes. I utilized industry-accepted methodologies for estimating disposal costs,
8 reviewed published survey data and obtained disposal price lists and quotes in 2009
9 from the 11 disposal facilities in the surrounding counties that currently receive non-
10 hazardous liquid waste from the area.

11 Q: WHAT DID YOU CONCLUDE?

12 A: The price of disposal per 10,000 gallons of liquid non-hazardous waste at TexCom's
13 proposed Class I UIC facility is estimated to be between \$1,500 and \$2,500. In
14 contrast, the range of disposal costs based on current disposal facility prices and
15 transportation costs at the 11 other facilities in the Houston-Galveston area is from
16 \$2,150 as an average minimum cost to \$4,200 as an average maximum cost, per 10,000
17 gallons of liquid non-hazardous waste. Thus, the proposed Class I UIC facility
18 represents an average savings of \$1,175, per 10,000 gallons of liquid non-hazardous
19 waste.

20 Q: TO WHAT FACTORS ARE THE COST SAVINGS ATTRIBUTABLE?

1 A: The proposed facility is located proximate to the generators in Montgomery County.
2 As such, a majority of the cost savings is attributable to reduced transportation costs.

3 Q: WHAT IS THE AVERAGE DISTANCE BETWEEN GENERATORS IN
4 MONTGOMERY COUNTY AND WHERE THEY ARE CURRENTLY
5 TRANSPORTING THEIR CLASS I NON-HAZARDOUS LIQUID WASTEWATER
6 FOR DISPOSAL?

7 A: About 82 miles.

8 Q: WHAT IS THE AVERAGE DISTANCE BETWEEN GENERATORS IN
9 MONTGOMERY COUNTY AND TEXCOM'S PROPOSED FACILITY?

10 A: About 7 miles.

11 Q: ARE TRANSPORTATION COSTS INCLUDED IN THE COST ESTIMATES YOU
12 GAVE EARLIER?

13 A: Yes. However, the fees charged by the different available disposal facilities varied
14 with respect to transportation costs. Some facilities provided a flat-fee pricing
15 structure while others provided estimates by-the-hour. For the purposes of the
16 comparison, I assumed four hours as a minimum value and eight hours as a maximum
17 value for facilities that provided pricing by-the-hour.

18 Q: DO THE COST ESTIMATES YOU GAVE EARLIER INCLUDE OTHER TAXES
19 AND FEES?

1 A: No, none of the above costs include any taxes or fees. Taxes are assumed to be equal
2 among the disposal options, but fees are charged on a facility basis and may vary
3 significantly (e.g. fuel surcharge, depending on the distance from generators to
4 disposers).

5 Q: WHAT IS YOUR ESTIMATE OF THE ANNUAL COST SAVINGS LOCAL
6 BUSINESSES THAT GENERATE LIQUID NON-HAZARDOUS WASTE IN
7 MONTGOMERY COUNTY WOULD REALIZE IF THEY WERE ABLE TO USE
8 TEXCOM'S PROPOSED FACILITY INSTEAD OF THE CURRENT DISPOSAL
9 METHOD?

10 A: Based on my review of publicly available data, businesses in Montgomery County
11 generated approximately 570 million gallons and 635 million gallons of liquid non-
12 hazardous waste in 2007 and 2008, respectively. In both years, 99.9% of the material
13 was generated within 7 miles of the proposed TexCom facility. Assuming an average
14 savings of approximately \$1,175 per 10,000 gallons, and assuming one-third of annual
15 liquid non-hazardous waste generated in Montgomery County could be disposed of at
16 the TexCom facility's initial well, I estimate the potential total annual cost savings for
17 local businesses could be as much as \$22 M to \$25 M.

18 Q: WILL THERE BE OTHER ECONOMIC BENEFITS SHOULD TEXCOM'S
19 PROPOSED FACILITY BE PERMITTED AND BUILT?

20 A: Yes, in addition to decreased costs for local businesses, there will be created jobs,
21 increased revenue to local businesses due to consumer spending from created jobs,
22 increased sales tax collections, enhanced commercial reputation of the county due to

1 decreased operating costs for local businesses, and, presumably, reduced traffic
2 incidents due to trucks transporting material fewer miles.

3 Q: HAVE YOU ESTIMATED WHAT THE INCREASED SALES TAX
4 COLLECTIONS MIGHT BE?

5 A: Yes. Assuming that 1/3 of the liquid non-hazardous waste generated in Montgomery
6 County would be disposed of in the proposed facility, and a sales tax rate of 8.25%, I
7 estimated the total sales tax collections from the proposed facility to be between about
8 \$2.4 million and \$4.4 million per year. Over the 10-year permit life, I estimated the
9 total benefit from sales tax collections to be between \$24 million and \$44 million,
10 without adjusting for inflation or applying a discount rate.

11 V. OTHER ISSUES

12 Q: LET'S MOVE ON TO OTHER ISSUES AFFECTING THE PUBLIC. HAVE YOU
13 IDENTIFIED OTHER REASONS WHY THE PROPOSED UIC WELL PERMIT
14 WOULD BENEFIT THE PUBLIC?

15 A: Yes, the availability of TexCom's proposed facility would result in reduced truck
16 traffic along the major routes from Montgomery County to out-of-county disposal
17 facilities, which would also presumably result in reductions in the number of traffic
18 accidents and injuries and the risk of deaths and spills from long distance hauling of
19 these wastes, as well as reductions in the associated air pollution which contributes to
20 ozone formation and energy consumption. It would also reduce the use of water
21 associated with alternative disposal methods since most alternatives entail larger

1 amounts of water use associated with steam generation, equipment washing and
2 cooling, and general water usage requirements. TexCom's proposed facility would
3 also offer an alternative to the current practice of pretreatment and discharge through
4 small package wastewater treatment facilities and POTWs and, in turn, a reduction in
5 the chemical loading to the public drinking water supplies.

6 Q: DESCRIBE THE ENERGY IMPACT OF TEXCOM'S PROPOSED FACILITY
7 VERSUS THAT OF THE CURRENT WASTE DISPOSAL METHODS FOR CLASS
8 1 LIQUID NON-HAZARDOUS WASTES GENERATED IN MONTGOMERY
9 COUNTY.

10 A: The energy impact of waste disposal activities in Montgomery County can be
11 evaluated by assessing energy use related to transportation of waste and energy related
12 to the different types of waste disposal activities associated with waste generated in
13 Montgomery County.

14 Because TexCom's proposed facility will provide an option to waste generators
15 located in Montgomery County to dispose waste locally versus transporting waste over
16 longer distances based on current disposal options, it is estimated that energy saved
17 with respect to reduced waste transportation requirements is in the range of 30 to 35%
18 of current energy usage.

19 Even though this analysis shows significant savings, it does not include additional
20 potential savings to be gained from reducing the loads on current disposal sites.

1 Q: WHAT WOULD BE THE IMPACT TO THE VOLUME OF AIR EMISSIONS
2 ASSOCIATED WITH DISPOSAL VIA TEXCOM'S PROPOSED FACILITY
3 VERSUS THAT ASSOCIATED WITH THE CURRENT WASTE DISPOSAL
4 METHODS FOR THE SUBJECT WASTES GENERATED IN MONTGOMERY
5 COUNTY?

6 A: The emissions impact of waste disposal activities in Montgomery County can be
7 evaluated by assessing emissions related to transportation of waste and related to direct
8 emission from waste disposal activities associated with waste generated in
9 Montgomery County.

10 The proposed maximum capacity of TexCom's proposed initial well represents 34% of
11 the current estimated annual volume of the subject waste generated in the County. The
12 air emissions associated with the transport of this include criteria pollutants such as
13 nitrogen oxides, volatile organic compounds (VOCs), particulate matter (PM), and
14 carbon monoxide (CO). The approval of the proposed UIC permit would result in
15 annual reductions of approximately 475,000 gallons of diesel and a substantial
16 reduction in the amount of air emissions from current out-of-county disposal. This
17 would result in a notable reduction (approximately one-third reduction) in air
18 emissions currently related to waste disposal in the area.

19 Q: ARE THERE OTHER TANGIBLE ENVIRONMENTAL BENEFITS OF THE
20 PROPOSED UIC WELLS?

21 A: Yes, currently Montgomery County Class I, non-hazardous wastes are partially treated
22 to meet surface water discharge permit limits and the receiving facilities are operating

1 with air emission permit limits. While many facilities operate within these surface
2 water discharge and air emission permit limits, others are characterized by periodic
3 violations, resulting in excessive discharges and air emissions. Even when facilities
4 operate within permit limits, these facilities release many tons of hazardous substances
5 into our area streams and into the air. Injection into the proposed UIC well, would
6 substantially reduce or eliminate these discharges and releases.

7 Q: WHAT IS THE RELEASE HISTORY OF UIC IN TEXAS AND THE UNITED
8 STATES?

9 A: I identified no releases to ground water from modern permitted UIC injection wells in
10 Texas and the United States. I identified only 4 instances of releases in the United
11 States and these were associated with use of former oil wells not completed as now
12 required by UIC regulations.

13 Q: IS THE RECORD OF UIC IN TEXAS BETTER THAN THE ALTERNATIVE
14 DISPOSAL OPTIONS FOR MONTGOMERY COUNTY WASTE?

15 A: Yes, I completed a partial review of the compliance record for the current disposal
16 options for Montgomery County waste. Consistent with my experience and reviews of
17 other projects, UIC is the safest option. I noted numerous instances of spills and
18 releases or exceedances of air emission and discharge permit limits for landfills,
19 wastewater treatment facilities and the incinerator disposal options I identified for
20 Montgomery County non-hazardous liquid wastes.

1 **VI. SUMMARY OF OPINION**

2 Q: MR. BOST, WHAT IS YOUR OVERALL CONCLUSION REGARDING
3 TEXCOM'S PROPOSED PROJECT?

4 A: The population and related industrial and commercial development in the Montgomery
5 County area is projected to increase substantially in the coming years. As a result, the
6 amount of wastes generated will increase. TexCom's proposed project would address
7 some, but not nearly all of the projected increased demand for waste disposal. I have
8 concluded that TexCom's proposed project is feasible and would be the safest, most
9 reliable and economical option for disposing of existing and future generated wastes,
10 and that no other disposal option is as safe, reliable and economical.